

Unit 11

Day 2

Parallel and Perpendicular Lines

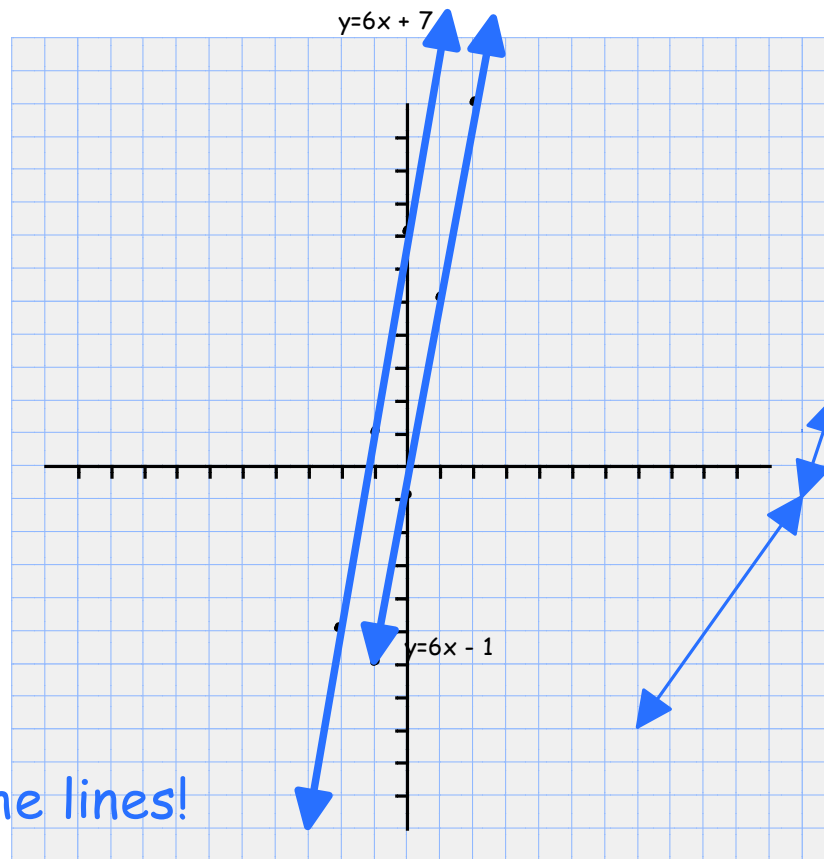
Parallel lines are a set of lines that do not intersect.
Parallel lines have slopes that are equal and y-intercepts
that are different.

Examples of Parallel Lines

$$y = mx + b$$

$$y = 6x + 7$$

$$y = 6x - 1$$



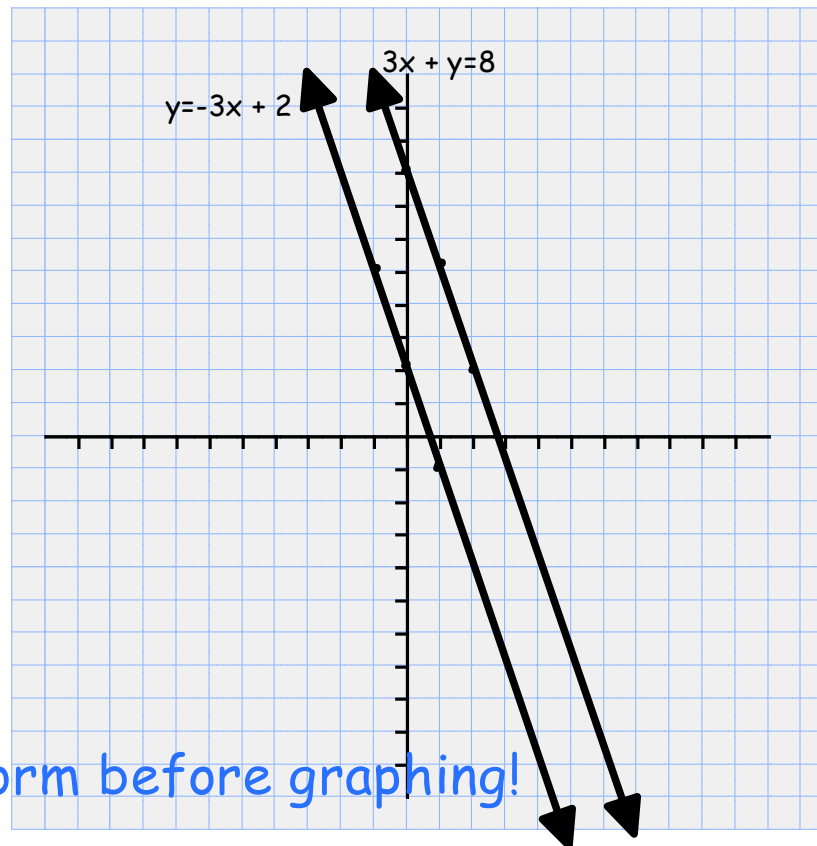
Note the inaccuracy of the lines!

Examples of Parallel Lines

$$3x + y = 8$$

$$y = -3x + 2$$

$$y = -3x + 8$$



Remember to put line in SI form before graphing!

Perpendicular lines are two lines that intersect to form right angles (90°). Perpendicular lines will have slopes that are opposite reciprocals.

(negative)

$$5$$

$$-\frac{1}{5}$$

$$-10$$

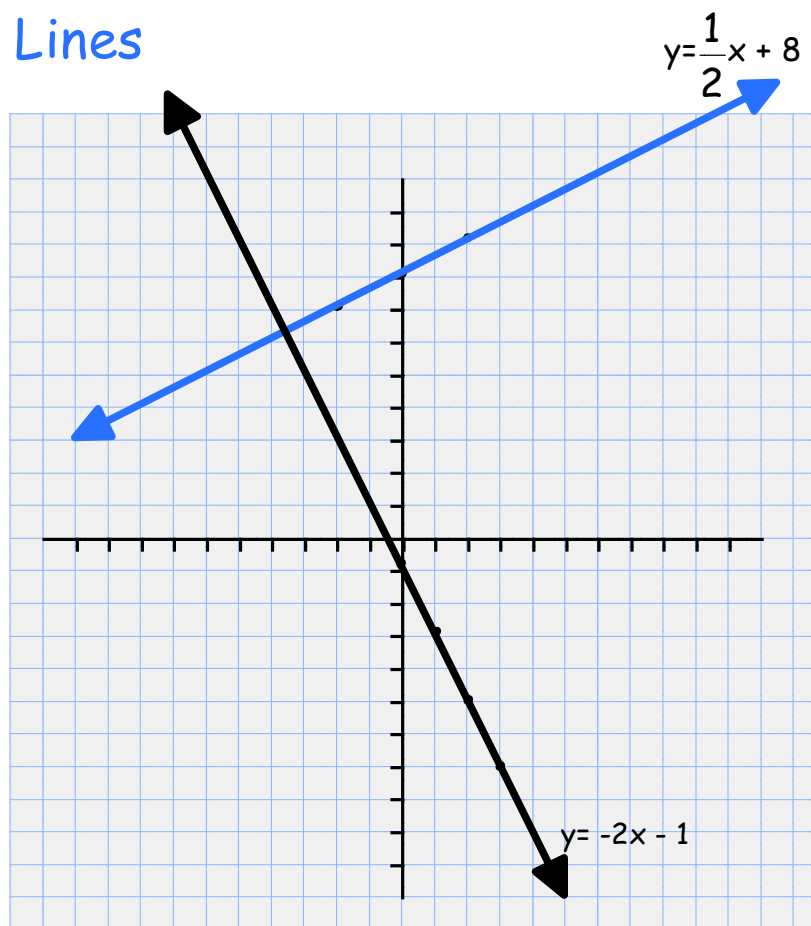
$$\frac{1}{10}$$

$$-\frac{2}{3}$$

$$\frac{3}{2}$$

Examples of Perpendicular Lines

$$y = \frac{1}{2}x + 8$$
$$y = -2x - 1$$



Examples of Perpendicular Lines

A $3x + 2y = 8$
B $-4x + 6y = 12$

$$2y = -3x + 8$$

$$y = -\frac{3}{2}x + 4$$

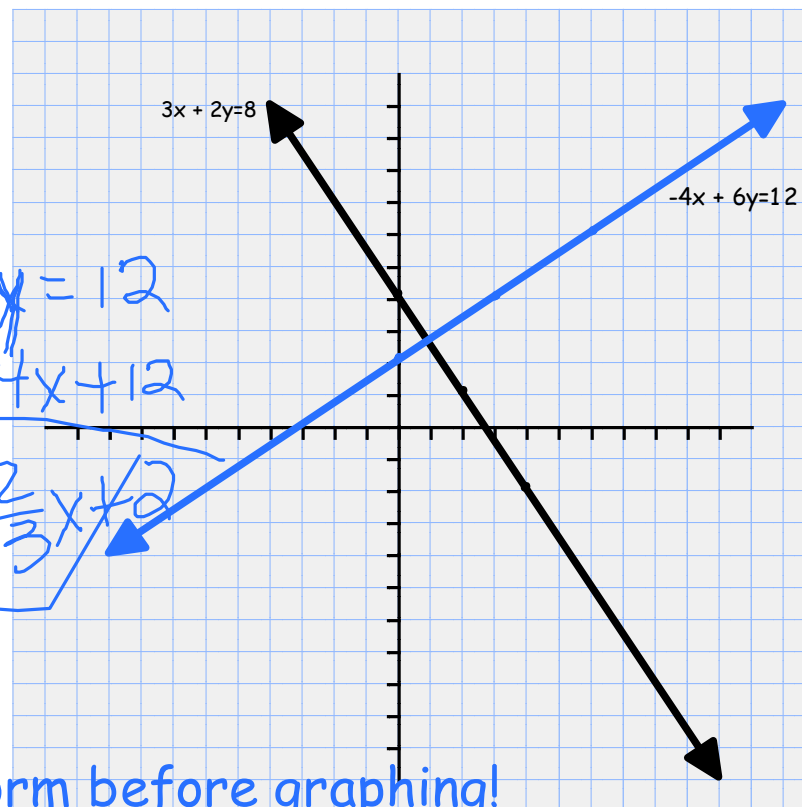
$$m = -\frac{3}{2}$$

$$\perp m = \frac{2}{3}$$

B $-4x + 6y = 12$

$$6y = 4x + 12$$

$$y = \frac{2}{3}x + 2$$



Remember to put line in SI form before graphing!

Determine if the lines through the given set of points are parallel, perpendicular, or neither to each other.

1) $(3,7)$ $(2,3)$ and $(2,-2)$ $(6,-3)$

$$m = \frac{3-7}{2-3} = \frac{-4}{-1} = 4$$

$$m = \frac{-3+2}{6-2} = \frac{-1}{4}$$



2) $(5,-4)$ $(5,7)$ and $y=3$

$$m = \frac{7+4}{5-5} = \frac{11}{0}$$

vert

horiz
 $m = 0$



3) Find the value of w so [↑] $(w, 3)$ $(-1, -6)$ is parallel to $6x - 2y = 7$. *find the line that goes through*

$$-2y = -6x + 7$$

$$y = 3x + \frac{7}{2}$$

$$m = 3$$

$$3 = \frac{-6 - 3}{-1 - w}$$

$$\frac{3}{1} = \frac{-9}{\textcircled{?}}$$

$$-3 - 3w = -9$$

$$-3w = -6$$

$$w = 2$$

$$(2, 3), (-1, -6)$$

- 4) Same as example 3, except find the value of w so that the lines will be perpendicular.

$$(w, 3) \times (-1, -6)$$

$$m = 3$$

$$\perp m = -\frac{1}{3}$$

$$-\frac{1}{3} = \frac{-6-3}{-1-w}$$

$$1+w = -27$$

$$w = -28$$

$$-\frac{1}{3} = \frac{-9}{-1-w}$$

$$1+w = -27$$

Homework: Parallel/Perpendicular Wksht 1-6